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diabetes & medical-dental management

The Growing Number of Diabetics in America: The Medical-Dental Partnership

The growing number of diabetic adults and children in America means that the number of patients with serious dental issues will only continue to grow. As a result, physicians and dentists alike must immediately become well-versed on the treatment possibilities for diabetic patients and how to work in concert with primary care physicians to ensure that prescribed care is implemented in a timely fashion and that the dentist is apprised of any changes in the progression and treatment of the patient's disease.

Some **20.8 million people**—about 7% of the population—have diabetes. Of this total, only 14.6 million people

have been professionally diagnosed as having diabetes. The growing prevalence of diabetes, the increasing lifespan of Americans and the increasing effectiveness of diagnostic and therapeutic protocols indicate that most dental practitioners will be treating more patients with diabetes.

Diabetes develops in people of all ages, although in greater frequency in African-Americans and Hispanics, for whom it has become more prevalent during the past several decades. In fact, a 1996 survey found that while 8.7% of whites over the age of 64 had diabetes as compared to 19.9% of African Americans in the same age



Check it Out:

To determine whether or not a patient has pre-diabetes or diabetes, a Fasting Plasma Glucose Test (FPG) or an Oral Glucose Tolerance Test (OGTT) is required. A fasting blood glucose level between 100 and 125 mg/dl signals pre-diabetes on an FPG test. A person with a fasting blood glucose level of 126 mg/dl or higher has diabetes. An oral glucose tolerance test measures the level of glucose after a fast and two hours after drinking a glucose-rich beverage. If the two-hour blood glucose level is between 140 and 199 mg/dl, the patient has pre-diabetes. If the two-hour blood glucose level is at 200 mg/dl or higher, the patient has diabetes.

The Growing Number of Diabetics in America: The Medical-Dental Partnership (*cont'd*)

group. The incidence of diabetes among Hispanics in the United States is about twice that for non-Hispanic whites.

Many of the estimated 6.2 million people who have diabetes but have not yet been diagnosed with the disease may be completely unaware that they have it. Dental professionals can assist these people by working in partnership with medical specialists and general practitioners; through progressive referrals and interaction, in receiving the diagnosis and treatment they need and play an important role in diagnosing and managing dental patients with diabetes.

A host of symptoms are considered in making a diagnosis of diabetes. Those symptoms **specific to dental care** include gingivitis, periodontitis, recurrent oral fungal infections, burning mouth and diminished sense of taste. A true opportunity exists for physicians to play a role in curbing the ill effects of diabetes and refer patients with suspect symptoms to a qualified dentist for evaluation and diagnosis. In addition, patients suffering from xerostomia or other salivary dysfunction, disorders of the oral mucosa such as lichen planus and recurrent aphthous stomatitis or

oral infections such as candidiasis should also be immediately referred by the attending dentist to a medical physician.

Poorly controlled diabetes leads to significant morbidity and mortality. Dentists can counsel their patients with diabetes about the need to improve glucose regulation, maintain oral and nutritional health, monitor glucose levels and seek medical attention for routine care.

Dentists, physicians and the medical community at large must familiarize themselves with the medications used to treat diabetes and avail themselves of information on common therapies. Oral hypoglycemic medications include sulfonylureas, which enhance insulin secretion; biguanides, which reduce hepatic glucose production; alpha-glucosidase inhibitors, which delay glucose adsorption; and thiazolidinediones, which enhance insulin sensitivity. Insulin is available in short-acting (one to 1 hours), regular-acting (four to six hours), intermediate-acting (eight to 12 hours) and long-acting (24–36 hours) formulations. Insulin pumps provide a continuous burst of insulin to help control serum glucose levels.

Periodontal Disease in Diabetic Patients: Influences and Implications for Medical Professionals

The bulk of recent scientific literature on periodontal disease in patients with type 1 diabetes clearly shows an increase in both the number of people affected and in the severity of their periodontal disease. Though there have been numerous studies, interpreting these is difficult because of small cohorts, lack of standardized reporting, differing diabetes complications among members of study groups and more.¹

However, improved comprehension of factors involved in periodontitis in diabetic patients is the only way that dentists and physicians can hope to improve the services they render to this segment of the populace. Because it stems from a chronic inflammation caused by various types of bacteria and microbes, periodontal disease is complex because diabetes hastens the degree and seriousness of periodontal breakdown. Multiple studies show that aggressive periodontitis is “the sixth complication of diabetes.”²

Patients with diabetes are clearly more likely to develop gingivitis, the first stage of periodontal disease, and studies show that this is so for both children and adults with poor metabolic control. In fact, children and adolescents who have diabetes are twice as likely to develop gingivitis as those who do not have diabetes, which is why diabetes mellitus-associated gingivitis is listed as a specific entity in the most recent classification of periodontal diseases.

The level of effectiveness of diabetes control is an important factor in gingivitis progression. Serum fructosamine levels, which reflect the patients’ glycemic control for the previous 14 to 21 days.³

However, gingivitis in subjects with diabetes is not related to higher levels of plaque accumulation because diabetes does not significantly increase the plaque index. **Normalizing diabetic patients’ glycemic levels may significantly reduce the severity and extent of gingivitis**

For pediatricians, it is important to note that gingivitis is common in diabetic patients younger than twelve years of age; periodontal disease has been found to occur in 9.8% of adolescents with diabetes as compared to 1.7% of adolescents without diabetes.

The length of time patients have had diabetes seems to increase their risks for developing periodontal disease; patients with less than 10 years as a diabetic seem to sustain more periodontal attachment than those who have had diabetes for more than 10 years, especially those patients over 35 years of age, as do diabetic patients with other complications of the disease.⁴

One study revealed that more than one-quarter of study subjects with type 1 diabetes and poor metabolic control had oral sites with attachment loss of 5 millimeters or greater, compared with 10 percent of the subjects with good metabolic control, while subjects

Did You Know?

Pregnant women who have never had diabetes before but who have high blood sugar (glucose) levels during pregnancy are said to have gestational diabetes, which affects approximately 4% of all pregnant women. In the United States alone, there are a reported 135,000 cases of gestational diabetes each year.

with poorly controlled diabetes had attachment loss of 2 mm or greater at an average of 24 percent of sites and patients with good-to-moderate diabetes control had similar levels of attachment loss at only 10 percent of sites.⁵

However, the percentage of sites with attachment loss of 2 mm or greater in subjects whose diabetes is well-controlled has been shown to be similar to the percentage of sites in patients without diabetes, which indicates that patients with well-controlled diabetes may not be at an increased risk of developing periodontal diseases.

The question dentists need to have answered is what they can do to delay or prevent their diabetic patients from developing periodontal disease and the answer comes from a collaborative medical approach. Working jointly with the primary care physician to help patients with diabetes improve their blood sugar controls is probably the best single step most dentists can take in this regard, especially as these patient are more likely to develop oral complications because their diabetes compromises their normal systemic defenses against disease and also leads to xerostomia and higher concentrations of glucose in saliva, both of which increases the likelihood of dental caries.

Obviously, if the diabetic patients are also smokers, they should be encouraged to quit smoking immediately and be given support during this process since patients with diabetes who are smokers may be at even greater risk of developing periodontal disease compared with non-smoking patients with diabetes.⁶

Dentists in North America have also become more vigilant about educating diabetic patients about the oral health consequences of poorly controlled diabetes and the need for rigorous dental hygiene, promptly treating oral infections and following up with a medical doctor. Pointing out that the possible oral complications of Type 1 diabetes include gingivitis and periodontal disease,

xerostomia due to loss of salivary gland function, increased susceptibility to oral yeast infections and dental caries, gum abscesses, tooth loss, lichen planus, burning mouth syndrome and potential difficulty in wearing dental prosthetics, especially if accompanied by photographs that demonstrate these effects, may be just what patients need to motivate them to achieve better glycemic control.

Another approach that may help considerably in motivating diabetic patients to take the steps they must take to achieve proper glycemic control is explaining to them that people with well-controlled diabetes who maintain appropriate glycemic levels can usually receive any dental treatments that patients without diabetes can receive. This is especially important for those diabetic patients who desire cosmetic dentistry to improve their smiles.

Overall, aggressive dental health management carried out in conjunction with the medical community is the best predictor for relieving periodontal disease in diabetic patients.

1. Maria Emanuel Ryan, D.D.S., Ph.D., Oana Carnu, D.M.D. and Angela Kamer, D.M.D., Ph.D. *The influence of diabetes on the periodontal tissues* J Am Dent Assoc, Vol 134, No suppl_1, 34S-40S.
2. Loe H. *Periodontal disease: the sixth complication of diabetes mellitus*. Diabetes Care 1993;16 (1):329-34.
3. Benjamin R, Sacks D. *Glycated protein update: implications of recent studies including the Diabetes Control and Complication Trial*. Clin Chem 1994;40:683-7.
4. Tervonen T, Oliver RC. *Long-term control of diabetes mellitus and periodontitis*. J Clin Periodontol 1993;20:431-5.
5. Tervonen T, Karjalainen KM. *Periodontal disease related to diabetic status: a pilot study of the response to periodontal therapy in type 1 diabetes*. J Clin Periodontol 1997;24:505-10.
6. Tsai C, Hayes C, Taylor GW. *Glycemic control of type 2 diabetes and severe periodontal disease in the US adult population*. Community Dent Oral Epidemiol 2002;30(3):182-92.

Treatment Considerations for Patients with Diabetes Mellitus

Diabetes Mellitus Type 1, which used to be known as insulin-dependent, childhood or juvenile diabetes, occurs because the insulin-producing beta cells, found in the islets of Langerhans in the pancreas, have declined in number, the patient's system vulnerable to T-cell mediated autoimmune attack. Unfortunately, no preventive measures against developing this disease are known; in fact, most Type 1 patients have good general health and have a healthy body weight at the onset of this disease. Although most dentists will largely treat Type 2 diabetic patients, it is still important to be familiar with dental treatment considerations for patients with Type 1 diabetes.

Current treatment for Type 1 diabetes consists of providing insulin delivered by subcutaneous injection, an insulin pump or by the Exubera, an inhaled form of insulin that received FDA approval in 2006 and carefully monitoring blood glucose levels with blood testing monitors.

Though Type 1 diabetes treatment, if performed with sufficient attention and care by the patient, does not hinder normal activities of daily living, treatment must be continued indefinitely and there are unique factors that affect dental care for diabetic patients of

which the treating physician must be aware. Diabetes is the most common endocrine disorder in the United States, affecting an estimated 16 million people with an additional six million having the disease without knowing it. Because of the significant risk that these undiagnosed victims will develop life-threatening complications due to increased susceptibility to infection, delayed healing, neuropathy, retinopathy, nephropathy, accelerated atherosclerosis, atherosclerotic aneurysm, coronary artery disease, myocardial infarction and amputation, it is especially important that dentists be aware of the symptoms and signs of diabetes as well as understand their role in managing the disease successfully and working with the primary care physician. ¹

Some evidence exists that good management of periodontal infections in uncontrolled or poorly controlled diabetic patients may ameliorate their blood sugar controls; these patient groups are more likely to develop oral complications due to their systems' reduced ability to respond to and defeat infection and increased concentrations of glucose in their saliva.

Researchers have found differing approaches in three areas of diabetes management between general dentists and periodontists:

assessing patient health status, discussing dental issues pertinent to the disease and active patient management. One study found that involvement with colleagues and medical experts and professional responsibility were influential predictors of active management for periodontists, while the variables pertaining to patient relations were significant predictors for general dentists. 2

Possible oral complications of Type 1 diabetes include gingivitis and periodontal disease, xerostomia and dysfunction of salivary glands, increased susceptibility to oral candidiasis and caries, abscesses, tooth loss, lichen planus, burning mouth syndrome and impaired ability to wear dental prosthetics.

General management for dental patients with Type 1 diabetes should include assessing glycemic control, referring those patients who have signs of uncontrolled diabetes to a physician for diagnosis and treatment, consulting with patients' physicians when systemic complications exist, aggressively treating oral infections and encouraging patients who smoke to stop smoking, scheduling patients' for frequent dental visits and using a glucometer to avoid diabetes-related emergencies.

Candidiasis is a marker for uncontrolled or poorly controlled diabetes, and dentists should take special care to avoid prescribing medications to control candidiasis that contains high levels of sugar.

Managing xerostomia can be achieved with saliva substitutes and salivary stimulants, which may also help to prevent future dental caries. Symptoms associated with burning mouth syndrome are contributed to xerostomia and candidiasis, and improved glycemic control is mandatory for controlling them. In low dosages, benzodiazepines, tricyclic antidepressants and some anticonvulsant medications have been shown to be effective in this regard. However, as these drugs come with a high degree of addiction, consulting with the patient's physician is essential.

Though patients with controlled diabetes can usually tolerate dental surgical procedures, it is important that they consume a normal diet following surgery to avoid low blood sugar and

insulin shock. Dentists performing oral surgery on diabetic patients should remain in close contact with the patients' physicians prior to and after surgery. Antibiotics, especially tetracycline, have been shown to be highly effective in preventing or diminishing infections following oral surgery. In fact, tetracycline and non-surgical debridement are central to treating diabetic dental patients because actual surgical procedures may require changing patients' medications both prior to and after surgery.

Erosive lichen planus can be successfully treated with corticosteroids and other immunomodulating drugs; however, because steroids can lead to hyperglycemia in diabetic patients, the attending dentist should once again collaborate closely with the physician in respect to prescription medication.

To summarize, dentists can play a key role in helping diabetic patients achieve and maintain glycemic control by treating oral infections and educating patients about the importance of maintaining unstinting oral hygiene. Patients with well-controlled diabetes who are maintaining appropriate glycemic levels can usually undergo any dental treatment that a healthy patient can. However, in patients with poorly managed or uncontrolled diabetes, consulting with the treating physician is necessary to avoid complications, contraindications and litigation. Of course, this works both ways—the physician must regularly refer diabetic patients for dental check-ups to maintain proper oral care, leading to overall optimal health management.

1. Anthony T. Verillo, D.D.S., Ph.D.: *Dental considerations for the treatment of patients with diabetes mellitus*: Am Dent Assoc, Vol 134, No suppl_1, 24S-33S.

2. Carol Kunzel, PhD, Evanthia Lalla, DDS, MS and Ira Lamster, DDS, MMSc: *Dentists' Management of the Diabetic Patient: Contrasting Generalists and Specialists*: AJPH First Look, published online ahead of print Feb 28, 2007 April 2007, Vol 97, No. 4 | American Journal of Public Health 725-730.

The Hidden Truth:

There are an estimated 54 million people in the U.S. who have "pre-diabetes" or blood glucose levels that are higher than normal but not yet high enough to be diagnosed as diabetes.

The Bottom Line:

The total annual economic cost of diabetes is estimated to be more than \$132 billion, or 1 out of every 10 health care dollars spent in the United States.

From:	To: